CLAIMS

We claim:

1. A method of assessing the ability of a candidate agent to modulate NGF activity comprising:

(a) contacting a culture of neurons expressing the high-affinity trk A receptor with a candidate agent and Nerve Growth Factor, and

(b) measuring the level of expression of two or more NGF responsive genes in said culture, wherein an alteration of the level of expression of the two or more genes indicates the therapeutic potential of the candidate agent.

2. The method of claim 1, wherein the culture of neurons expressing the high-affinity trk A receptor is a primary neuronal culture.

3. The method of claim 2, wherein the neurons are nociceptive neurons of the Dorsal Root Ganglia, trigeminal ganglion nociceptive and non nociceptive neurons, sympathetic neurons or Nerve Growth Factor responsive subpopulations of the nodose ganglia and basal forebrain cholinergic neurons.

4. The method of claim 3, wherein the neurons are nociceptive neurons of the Dorsal Root Ganglia neurons.

5. The method of claim 1, wherein the neurons in the culture are between about 100- to about 1000 cells per well or between about 100- to about 200 cells per well.

6. The method of claim 5, wherein the neurons in the culture are between about between about 3.5 cells per square millimeter to about 35 cells per square millimeter or 3.5 cells per square millimeter to about 35 cells per square millimeter.

7. The method of claim 1, wherein the Nerve Growth Factor concentration is between about 0.01 ng/ml to about 1000 ng/ml.

8. The method of claim 7, wherein the Nerve Growth Factor concentration is between about 0.1 ng/ml to about 50 ng/ml.

9. The method of claim 1, wherein expression of at least one gene of the two or more genes is enhanced in the presence of Nerve Growth Factor.

10. The method of claim 9, wherein the gene is spinocerebellar ataxia type 1 (sca 1), substance P, lymphocyte antigen 86(MD-1), Hippocampus cDNA homologue to Microsomal Signal Peptidase, Neuronal Leucine Rich Repeat Protein 1 (NLRR-1), Synaptotagmin V, Cadherin 1, ESTs weakly similar to KIAA0982 protein or RIKEN cDNA 2310042NO2.

11. The method of claim 1, wherein expression of at least one gene of the two or more genes is diminished in the presence of Nerve Growth Factor.

12. The method of claim 11, wherein the gene is small proline–rich repeat protein 1A, Motopsin (Neurotrypsin), Inhibin Beta B, G protein-coupled receptor 19, Lipocalin 2, or Troponin C.

13. The method of claim 1 wherein the two or more genes comprise Substance P and galanin or Substance P and small proline rich repeat protein 1A (sprr1A).

14. The method of claim 1, wherein the candidate agent is an antibody.

15. The method of claim 1, further comprising the step of isolating RNA from the neurons.

16. The method of claim 15, wherein the isolation utilizes silica based magnetic beads that bind RNA under high salt conditions and wherein the silica based magnetic beads are washed with about 80% ethanol.

17. The method of claim 16, wherein the RNA isolated by said method is detected by polymerase chain reaction using intron spanning primers.

18. The method of claim 1, wherein the candidate agent is dissolved in an organic solvent.

19. The method of claim 18, wherein the organic solvent is dimethyl sulphoxide.

20. A method of assessing the therapeutic potential of a combination therapy comprising Nerve Growth Factor, said method comprising:

(a) contacting a culture of neurons expressing the high-affinity trk A receptor with two or more candidate agents and Nerve Growth Factor, and

(b) measuring the level of expression of at least two NGF responsive genes in said culture, wherein an alteration of the level of expression of the genes indicates the therapeutic potential of the combination therapy.

21. The method of claim 20, wherein the culture of neurons expressing the high-affinity trk A receptor is a primary nociceptive neuronal culture.

22. The method of claim 21, wherein the neurons are dorsal root ganglion neurons or trigeminal ganglion neurons.

23. The method of claim 20, wherein the neurons in the culture are between about 100 to about 200 cells per well or 3.5 cells per square millimeter to about 7 cells per square millimeter.

24. The method of claim 20, wherein the NGF concentration is between about 0.1 ng/ml to about 50 ng/ml.

25. The method of claim 20, wherein the two or more genes comprise Substance P and galanin or Substance P and small proline rich repeat protein 1A (sprr1A).

26. The method of claim 20, wherein at least one of the two or more candidate agents is an antibody.

27. A method of assessing the ability of a candidate agent to modulate NGF activity comprising:

(a) contacting a culture of neurons expressing the high-affinity trk A receptor with a candidate agent and NGF, and

(b) measuring the level of expression of one or more NGF responsive genes in said culture, wherein an alteration of the level of expression of the one or more genes indicates the therapeutic potential of the candidate agent.

28. The method of claim 27, wherein the culture of neurons expressing the high-affinity trk A receptor is a primary nociceptive neuronal culture.

29. The method of claim 28, wherein the neurons are dorsal root ganglion neurons or trigeminal ganglion neurons.

30. The method of claim 27, wherein the neurons in the culture are between about 100- to about 200 cells per well or 3.5 cells per square millimeter to about 7 cells per square millimeter.

31. The method of claim 27, wherein the NGF concentration is between about 0.1 ng/ml to about 50 ng/ml.

32. The method of claim 27, wherein the one or more genes comprise substance P, galanin or sprr 1.